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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,400	06/16/2005	Takashi Fujikawa	Q88448	2906

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EXAMINER	
HAILEY, PATRICIA L	
ART UNIT	**PAPER NUMBER**
1793	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/539,400	FUJIKAWA ET AL.	
	Examiner	Art Unit	
	Patricia L. Hailey	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06/16/05 and 01/17/06 (replacement dwgs)* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/16/05; 12/13/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Applicants' Preliminary Amendments filed on June 16, 2005, and on January 17, 2006, have been made of record and entered. The former corrects an inadvertent clerical error on page 67 of the Specification (and does not add new matter); the latter submits replacement drawings.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Documents were filed on June 16, 2005.

Drawings

2. The replacement drawings for Figures 1 and 2 were received on January 17, 2006. These drawings are acceptable.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-6 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, 5, 7, and 8 of copending Application No. 10/344,317.

(The claims in the '317 application that are applied in this rejection are those filed on February 21, 2007. The '317 application was allowed on May 24, 2007; however, an amendment after allowance was filed on August 9, 2007; no response to the amendment after allowance has been noted.)

Although the conflicting claims are not identical, they are not patentably distinct from each other because the respective sets of claims are directed to a catalyst for hydrotreating gas oil, said catalysts each comprising an inorganic oxide support, at least one metal selected from Group 6 metals, at least one Group 8 metal, and phosphorus, each in terms of a respective oxide based on the catalyst, and either "carbon in terms of an element" (in the instant application) or "an organic acid... as an amount of carbon" ('317 application), each in amounts of 2 to 14 wt.%.

In the instant application, the Group 6 metal is present in an amount of 10 to 40% by weight, the Group 8 metal is present in an amount of 1 to 15% by weight, and phosphorus is present in an amount of 1.5 to 8% by weight.

In the '317 application, the Group 6 metal is present in an amount of from 10 to 30% by weight, the Group 8 metal is present in an amount of from 1 to 15% by weight, and phosphorus is present in an amount of from 1.5 to 6% by weight.

The respectively claimed catalysts exhibit comparable specific surface areas (150-300 m^2/g in the instant application versus 220-300 m^2/g in the '317 application), pore volumes (0.3-0.6 ml/g in the instant application versus 0.35 to 0.6 ml/g in the '317 application), and average pore diameters (65-140 angstroms in the instant application versus 65-95 angstroms in the '317 application).

Claims 3-5 in the instant application are nearly identical to claims 4, 5, and 7 of the copending '317 application.

Claim 6 in the instant application is identical to claim 8 of the copending '317 application, except for the respective claim dependencies.

Although the claims in the instant application recite an additional property of the catalyst, in that, when the catalyst is observed on a diffuse-reflectance FT-IR after sulfidation treatment and subsequent NO adsorption, a value of I8 group/ (I8 group + I6 group) is within the range of 0.7 to 1, it would necessarily follow that these properties would be exhibited by the catalyst in the copending '317 application, given the comparable amounts of the respectively cited and claimed components.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 1, 5, and 6 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, and 7 of copending Application No. 10/594,451.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the respective sets of claims are drawn to catalysts comprising an inorganic oxide support, 10 to 40% by weight of at least one Group 6 metal, 1 to 15% by weight of at least one Group 8 metal, and 2 to 14% by weight of carbon.

In the instant application, phosphorus (in terms of an oxide) is present in an amount of 1.5 to 8% by weight; in the '451 application, phosphorus oxide is present in an amount of 15% by weight or less.

The respectively claimed catalysts exhibit comparable specific surface areas (150-300 m^2/g in the instant application versus 100-400 m^2/g in the '451 application), pore volumes (0.3-0.6 ml/g in the instant application versus 0.2 to 0.6 ml/g in the '451 application), and average or mean (synonymous terms) pore diameters (65-140 angstroms in the instant application versus 50-200 angstroms in the '451 application).

Claims 5 and 6 in the instant application are comparable to claims 4 and 7, respectively, of the copending '451 application.

Although the claims in the instant application recite an additional property of the catalyst, in that, when the catalyst is observed on a diffuse-reflectance FT-IR after sulfidation treatment and subsequent NO adsorption, a value of I8 group/ (I8 group + I6 group) is within the range of 0.7 to 1, it would necessarily follow that these properties

would be exhibited by the catalyst in the copending '451 application, given the comparable amounts of the respectively cited and claimed components.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dai et al. (U. S. Patent No. 5,397,456) in view of Dufresne et al. (U. S. Patent No. 6,559,092).

Dai et al. disclose a catalyst comprising an alumina support bearing 3-6 wt. % of a Group VIII (8) metal oxide, 14.5-24 wt.% of a Group VI-B (6) metal oxide, and 0-6 wt.% of a phosphorus oxide, said catalyst having a Total Surface Area of 240-310 m^2/g, a Total Pore Volume of 0.5-0.75 cc/g (ml/g), and a Pore Diameter Distribution whereby 63-78% of the Total Pore Volume is present as micropores of diameter 55-115 angstroms and 11-18% of the Total Pore Volume is present as macropores of diameter greater than 250 angstroms. See col. 5, lines 24-35 of Dai et al. (considered to read upon **claims 1 and 2**).

Dai et al. also disclose a process for hydrotreating a charge hydrocarbon feed, such as gas oils, under conditions such as a hydrogen charge rate of 200-10,000 SCFB, operation temperatures of from 700°F-900°F (371.1-482.22°C), operation pressures of 1500-10,000 psig), and a space velocity of 0.1-1.5 volumes of oil per hour per volume of reactor (hr^{-1}). See col. 6, lines 25-43 of Dai et al. (considered to read upon **claim 6**).

Due to the temperature range, a substantial portion of the feedstock will be in the vapor phase, which will exert a substantial partial pressure. Therefore, out of the total

operating pressure range of Dai et al., the hydrogen partial pressure (i.e., the portion of the overall operating pressure represented by the hydrogen feed) of Patentees' process should fall within Applicants' claimed hydrogen partial pressure of 3 to 8 MPa.

The catalyst is prepared by loading an alumina with metal and phosphorus components, followed by drying and calcining. See col. 7, lines 30-61 of Dai et al.

Dai et al. do not teach or suggest the presence of a carbon component, as recited in claim 1, and do not specifically disclose a drying temperature of 200°C or lower, as recited in claim 5.

Dufresne et al. disclose that subjecting hydrotreating catalysts to carbonization improves the hydrodesulphurizing and hydrogenating properties of the catalysts, as well as reduce initial selectivity for the cracking product and for isomerization. See col. 1, lines 50-58 of Dufresne et al.

Carbonization can be performed with carbon-containing sources such as organic acids; the quantity of carbon deposited at the end of the impregnation step ranges from about 2 to 30% by weight with respect to the mass of oxide catalyst. Following the impregnation, a heat treatment step is carried out at a temperature ranging from 150°C to 650°C. See col. 2, lines 1-37 of Dufresne et al.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Dai et al. by incorporating therein a carbon component, followed by a heat treatment at a temperature ranging from 150°C to 650°C, as suggested by Dufresne et al., in an endeavor to improve the hydrodesulphurizing and hydrogenating properties of the prior art catalysts.

10. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dai et al. (U. S. Patent No. 5,397,456) in view of Dufresne et al. (U. S. Patent No. 6,559,092) as applied to claims 1, 2, 5, and 6 above, and further in view of "Morphology Study of MoS_2- and WS_2-Based Hydrotreating Catalysts by High-Resolution Electron Microscopy," by E. Payen et al. (hereinafter "the Payen Article"), Applicants' submitted art.

Dai et al. and Dufresne et al. are relied upon for their teachings with respect to claims 1, 2, 5, and 6. Neither of these references teach or suggest the limitations of claims 3 and 4 regarding the average number of laminated layers of disulfide of the Group 6 metal, and of the average in-plane-direction length of layers of disulfide of the Group 6 metal.

Nonetheless, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the phosphorus-containing catalysts resulting from the combination of the Dai et al. and Dufresne et al. references would exhibit the length (L) and layer stacking distribution (N) values as set forth in Applicants' claims 3 and 4, motivated by the fact that the Payen Article, also drawn to catalysts comprising Group 6 metal, Group 8 metal, and/or phosphorus on alumina supports, discloses that the inclusion of phosphorus induces layer stacking, with mean length and layer stacking distribution values of between 2.4-4.4 nm and 1.4-2.7 layers, respectively. See page 128 of the Payen Article, in the section entitled "Effect of Additives (Samples 10 to 15)", as well as Table 2 of the Payen Article, Catalyst numbers 10 and 12, and the Abstract.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369. The examiner can normally be reached on Mondays-Fridays, from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patricia L. Hailey/plh
Examiner, Art Unit 1793
October 29, 2007